

LISTING OF THE CLAIMS

The following is a complete listing of all the claims in the application, with an indication of the status of each:

- 1 1. (Canceled)
- 1 2. (Currently amended) The mesh generation system according to claim 1, wherein
2 said mesh characteristic extraction unit extracts said characteristic of said conventional
3 mesh based on the geometrical characteristic of the elements of said conventional mesh.
- 1 3. (Currently amended) The mesh generation system according to claim 1, wherein
2 said mesh characteristic extraction unit extracts said characteristic as a tensor field.
- 1 4. (Currently amended) The mesh generation system according to claim 1, further
2 comprising:
3 a mesh characteristic changing unit for changing said characteristic of said
4 conventional mesh extracted by said mesh characteristic extraction unit,
5 wherein said mesh generator generates a mesh based on said characteristic of said
6 mesh changed by said mesh characteristic changing unit.
- 1 5. (Original) The mesh generation system according to claim 3, further comprising:
2 a tensor field synthesization unit for synthesizing tensor fields describing multiple
3 mesh characteristics extracted by said mesh characteristic extraction unit,
4 wherein said mesh generator generates a mesh by using the tensor field obtained
5 by said tensor field synthesization unit.

- 1 6. (Original) The mesh generation system according to claim 3, further comprising:
2 a tensor field extrapolation unit, for receiving a shape model for mesh generation
3 and for extrapolating said tensor field that is extracted by said mesh characteristic
4 extraction unit and that indicates said characteristic of said conventional mesh, so that
5 said tensor field matches said shape model,
6 wherein said mesh generator generates a mesh by using said tensor field obtained
7 by said tensor field extrapolation unit.
- 1 7. (Canceled)
- 1 8. (Currently amended) The design support system according to claim ~~7~~ 27, wherein said
2 mesh generation ~~means~~ unit extracts the characteristic of ~~said a~~ predetermined mesh as a
3 tensor field; and employs said characteristic to generate a mesh for said shape model.
- 1 9. (Currently amended) ~~An analysis system, for performing finite element analysis of a~~
2 ~~predetermined shape model, comprising~~ The mesh generation system according to
3 claim 3, wherein:
4 ~~said~~ mesh generation ~~means for generating~~ unit generates a mesh for a target
5 shape model based on the characteristic of a predetermined mesh consonant with an
6 analysis purpose; and
7 a finite element analysis ~~means for performing~~ unit performs a finite element
8 analysis based on said ~~obtained~~ mesh generated by said mesh generator.
- 1 10. (Currently amended) The analysis system according to claim 9, wherein said mesh
2 generation ~~means~~ unit generates a mesh for said shape model based on said mesh
3 characteristic represented as said tensor field.

1 11. (Currently amended) ~~An analysis method for analyzing a characteristic of a~~
2 ~~predetermined mesh using a computer comprising~~ The method of claim 24, wherein the
3 step of using a mesh characteristic extraction unit to receive a conventional mesh and
4 extract a characteristic from said conventional mesh includes the step of:
5 ~~receiving a mesh to be analyzed;~~
6 extracting the characteristic of said mesh as a tensor field; and
7 ~~outputting said characteristic of said mesh.~~

1 12. (Currently amended) The analysis method according to claim 11, wherein ~~said step~~
2 ~~of extracting said characteristic of said mesh includes~~ the step of using a mesh
3 characteristic extraction unit to receive a conventional mesh and extract a characteristic
4 from said conventional mesh further includes the steps of:
5 calculating an inertia tensor for each of the elements of said mesh; and
6 calculating an overall tensor field for said mesh based on said inertia tensor
7 obtained for each of said elements.

1 13. (Currently amended) ~~An analysis method for analyzing a characteristic of a~~
2 ~~predetermined mesh using a computer comprising~~ The method of claim 24, wherein the
3 step of using a mesh characteristic extraction unit to receive a conventional mesh and
4 extract a characteristic from said conventional mesh includes the step of:
5 extracting a characteristic of an analysis target mesh as a tensor field.

1 14. (Currently amended) ~~An analysis method for analyzing a characteristic of a~~
2 ~~predetermined mesh using a computer comprising~~ The method of claim 24, wherein the
3 step of using a mesh generator to generate a mesh for a target shape model includes the
4 steps step of:
5 ~~extracting a characteristic from a conventional mesh; and~~
6 generating a mesh for a predetermined shape model based on the extracted

7 characteristic.

1 15. (Currently amended) The ~~mesh-generation~~ method according to claim 14, ~~wherein~~
2 ~~said step of extracting said characteristic includes~~ further including the steps of:

3 calculating the size of each of said elements of said conventional mesh; and
4 employing the size of each of said elements to calculate a field describing said
5 characteristic of said conventional mesh and corresponding to said overall conventional
6 mesh.

1 16. (Currently amended) The ~~mesh-generation~~ method according to claim 14, ~~wherein~~
2 ~~said step of extracting said characteristic may include~~ further including the steps of:

3 calculating not only the sizes of said elements of said conventional mesh, but also,
4 for each of said elements, the direction of flow, and the size and the aspect ratio of an
5 ellipse or of an ellipsoid, which are defined based on said elements; and
6 employing said direction of flow, and said size and said aspect ratio of said ellipse
7 or said ellipsoid, to calculate a field describing said characteristic of said conventional
8 mesh and corresponding to the overall conventional mesh.

1 17. (Currently amended) The ~~mesh-generation~~ method according to claim 14, ~~wherein~~
2 ~~said step of extracting said characteristic includes~~ further including the steps of:

3 calculating an inertia tensor for each of said elements of said conventional mesh;
4 calculating a tensor field, based on said inertia tensor obtained for each of said
5 elements, for said overall conventional mesh; and
6 extrapolating said obtained tensor field, so that for mesh generation said tensor
7 field matches said shape model.

1 18. (Currently amended) The ~~mesh-generation~~ method according to claim 14, ~~wherein~~
2 ~~said step of extracting said characteristic includes~~ further including the steps of:

3 calculating an inertia tensor for each of said elements of said conventional mesh;
4 and
5 employing said inertia tensor for each of said elements to directly calculate a
6 tensor field that is extrapolated for the entire shape model.

1 19. (Canceled)

1 20. (Currently amended) The ~~storage medium program transmission apparatus~~ according
2 to claim ~~19~~ 25, wherein said computer code contained in said storage medium program
3 ~~also permits said computer to perform~~ further implements the step of:
4 ~~a process for calculating~~ processing the calculation of a tensor field defined based
5 on said elements of said predetermined mesh in order to extract said characteristic.

1 21. (Currently amended) ~~A~~ The program transmission apparatus according to claim 25,
2 further comprising:
3 ~~storage means, for storing a program that permits a computer to perform;~~
4 ~~—— a process for extracting from a predetermined mesh a characteristic that matches~~
5 ~~the purpose of finite element analysis, and~~
6 ~~—— a process for generating for a predetermined shape model a mesh based on the~~
7 ~~characteristic extracted from said predetermined mesh; and~~
8 transmission means; for reading said program from said storage ~~means~~ medium
9 and transmitting said program.

1 22. (Canceled)

1 23. (New) A mesh generation system for generating a mesh used for finite element
2 analysis, comprising:
3 a mesh characteristic extraction unit which receives a conventional mesh and

4 extracts a characteristic from said conventional mesh,
5 a mesh characteristic change unit which changes a characteristic of a mesh
6 extracted by said mesh characteristic extraction unit,
7 a mesh generator which generates a mesh for a target shape model in accordance
8 with
9 a characteristic extracted by said mesh characteristic extraction unit or
10 a characteristic extracted by said mesh characteristic extraction unit as
11 changed by said mesh characteristic change unit, and
12 a display to which said mesh may be sent as an output.

1 24. (New) A computer-implemented method for generating a mesh used for finite
2 element analysis, comprising the steps of:
3 using a mesh characteristic extraction unit to receive a conventional mesh and
4 extract a characteristic from said conventional mesh,
5 using a mesh characteristic change unit to change a characteristic of a mesh
6 extracted by said mesh characteristic extraction unit,
7 using a mesh generator to generate a mesh for a target shape model in accordance
8 with
9 a characteristic extracted by said mesh characteristic extraction unit or
10 a characteristic extracted by said mesh characteristic extraction unit as
11 changed by said mesh characteristic change unit, and
12 sending said mesh as an output to a display.

1 25. (New) A program transmission apparatus for instructing a computer to generate a
2 mesh used for finite element analysis, comprising:
3 storage medium for computer code implementing the steps of:
4 processing a mesh characteristic extraction unit which receives a conventional
5 mesh and extracts a characteristic from said conventional mesh,

6 processing a mesh characteristic change unit which changes a characteristic of a
7 mesh extracted by said mesh characteristic extraction unit,
8 processing a mesh generator which generates a mesh for a target shape model in
9 accordance with
10 a characteristic extracted by said mesh characteristic extraction unit or
11 a characteristic extracted by said mesh characteristic extraction unit as
12 changed by said mesh characteristic change unit, and
13 processing said mesh as an output to a display.

1 26. (New) A design support system, for using a computer to support design, comprising:
2 a mesh generation system which receives a template mesh as an input for a mesh
3 characteristic extraction unit and receives a shape model as an input for a mesh generator;
4 a mesh characteristic extraction unit which receives a conventional mesh and
5 extracts a characteristic from said conventional mesh,
6 a mesh characteristic change unit which changes a characteristic of a mesh
7 extracted by said mesh characteristic extraction unit,
8 a mesh generator which generates a mesh for a target shape model in accordance
9 with
10 a characteristic extracted by said mesh characteristic extraction unit or
11 a characteristic extracted by said mesh characteristic extraction unit as
12 changed by said mesh characteristic change unit, and
13 a display to which said mesh may be sent as an output.

1 27. (New) The design support system of claim 26, wherein said mesh generation system
2 may also receive a shape model as an input for a tensor field extraction unit.